



Issue 1 July 2021

Guidance on the carriage of compressed gas cylinders for the RACHP industry

The carriage of gas cylinders is covered by the ADR regulations 'The European Agreement Concerning the International Carriage of Dangerous Goods by Road'. This is implemented in UK law by 'The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009' statutory instrument 2009 No. 1348.

This document aims to answer some FAQs regarding carriage of all gas cylinders (including refrigerant cylinders) being carried on small to medium sized service, installation and wholesaler's delivery vehicles typically falling into the 'Small Load' exemptions.

I am just a small company (sole trader) do I have to comply with the ADR regulations?

Yes, everyone carrying gas cylinders in the course of their work in a vehicle must follow basic safety requirements from sole traders with one vehicle to wholesalers with a fleet of delivery vehicles.

I have heard that there are different requirements for ADR defined "large loads". As a service engineer am I ever likely to be caught by having a "large load"?

Typically, someone falling into the large load criteria is likely to be a bulk delivery driver. Most service and small delivery vehicles will be covered by small load threshold (exemption) requirements (ADR 1.1.3.6) i.e., not exceeding 1000 mixed transport units - TUs.

How do I determine the number of transport units (TUs) per cylinder?

- For compressed gases (e.g., Oxygen Nitrogen) use the cylinder water capacity in litres
- For liquefied gases (e.g., refrigerants) use the net mass (weight) of gas in kg
- For dissolved gases (e.g., acetylene) use the net mass (weight) of gas in kg

How do I calculate my mixed load transport units?

1. For flammable gases (A2L & A3 refrigerants, acetylene, propane including Mapp gas) – F (flammable) transport units per cylinder x number of cylinders x 3
2. For asphyxiant/oxidant gases (e.g., compressed gases, A1 refrigerants, oxygen) – A (asphyxiant) transport units per cylinder x number of cylinders x 1
3. These two totals added together will determine the total transport units
4. If the total is below 1000 units, the small load requirements apply



Issue 1 July 2021

What are the small load requirements?

This will apply to most service and small delivery vehicles but the assessment for individual vehicles still needs to be completed:

- Cylinders should be secured (strapped or caged) and should not project beyond the sides or end of vehicle, acetylene cylinders should be stored upright (ADR 7.5.7)
- If the vehicle is closed it shall be ventilated or marked
- Vehicle must be equipped with a suitable 2 kg fire extinguisher (ADR 8.1.4.2)
- Driver must have received appropriate general training (ADR 1.3.2 & 1.3.3)
- Safety data sheets or TREM cards must be carried in the vehicle

Do vehicles need ventilation? Do I have to have a van, or can I use a normal passenger car or estate to carry cylinders?

Vehicles used for the transportation of gas cylinders should ideally be open. If the vehicle is closed in it must be well ventilated (top and bottom). Toxic gases (e.g., ammonia) must not be carried in a closed vehicle unless specifically designed for the purpose. Cylinders must be restrained to avoid load movement. You should carry out a risk assessment to see if your vehicle is suitable. Many companies are now moving to the exclusive use of vans with a sealed bulkhead and forced ventilation in the load compartment for this reason.

If a vehicle is closed and not ventilated the access doors should be marked 'WARNING NO VENTILATION OPEN WITH CAUTION'

What Safety Equipment do I need to carry on my vehicle?

One 2kg fire extinguisher is required on all vehicles carrying gas cylinders (Dry powder recommended). Normally it is sited in the rear of the vehicle or in the driver's compartment (ADR 8.1.4.2).

What else should I know about carrying cylinders safely in my van?

- Cylinder valves must be closed whilst in transit and all equipment such as gauges regulators and adaptors should be removed
- Refrigerant cylinders should be capped, and valves checked to be firmly shut in all cases
- Cylinder labels must never be removed or defaced

Do I have to have Hazard Diamonds (compressed gas, flammable gas) on my vehicle?

Marking of vehicles (Hazard Diamonds) is not strictly required when under the ADR threshold but is extremely useful to the emergency services in an accident, especially if the driver is unconscious. You should remove these when not carrying cylinders in which case magnetic signs are advisable.



What other Information about the load should I carry with me? And what paperwork do I have to carry legally?

It is mandatory to carry the Safety Data Sheets (MSDS, available from the gas supplier) for any fluid that is in your vehicle. These should be visible to the emergency services in case the driver is unable to tell them about the load.

EXAMPLES

Example of cylinders on a service / installation vehicle

- 1 x Acetylene 10 litres (2kg dissolved)
- 1 x Oxygen 10 litres (water capacity)
- 2 x Nitrogen 10 litres (water capacity)
- 1 x 13kg R134a
- 1 x 12kg R448A
- 1 x 9kg R454C
- 2 x 10kg R32

ADR – Calculation of a Mixed Load					
Product Description	Number of Cylinders Carried	Cylinder Transport Units (per cylinder)	Total Cylinder Transport Units (No x TU)	Multiplier for Mixed Load	Transport Units
Oxygen	1	10	10	1	10
Nitrogen	2	10	20	1	20
R134a	1	13	13	1	13
R448A	1	12	12	1	12
R454C	1	9	9	3	27
R32	2	10	20	3	60
Acetylene	1	2	2	3	6
Transport Units – Mixed Load (<1000 TUs)					148

Example of cylinders on a wholesaler’s delivery vehicle

- 6 x Acetylene 10 litres (2kg dissolved)
- 6 x Oxygen 10 litres (water capacity)
- 6 x Nitrogen 10 litres (water capacity)
- 10 x 23kg R744
- 4 x 13kg R134a
- 2 x 54kg R448A
- 4 x 9 kg R454C
- 6 x 10kg R32



Issue 1 July 2021

ADR – Calculation of a Mixed Load					
Product Description	Number of Cylinders Carried	Cylinder Transport Units (per cylinder)	Total Cylinder Transport Units (No x TU)	Multiplier for Mixed Load	Transport Units
Oxygen	6	10	60	1	60
Nitrogen	6	10	60	1	60
R744	10	23	230	1	230
R134a	4	13	52	1	52
R448A	2	54	108	1	108
R454C	4	9	36	3	108
R32	6	10	60	3	180
Acetylene	6	2	12	3	36
Transport Units – Mixed Load (<1000 TUs)					834

Note: It is likely that this example load would exceed the weight load capacity of the delivery vehicle and as such that would determine the load.

Where can I find out more about this regulation and requirements?

- <http://www.hse.gov.uk/cdg>
- Contact your Health & Safety adviser within your company

The Health and Safety Executive have a section on their website which includes a Carriage of Dangerous Goods Manual.

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